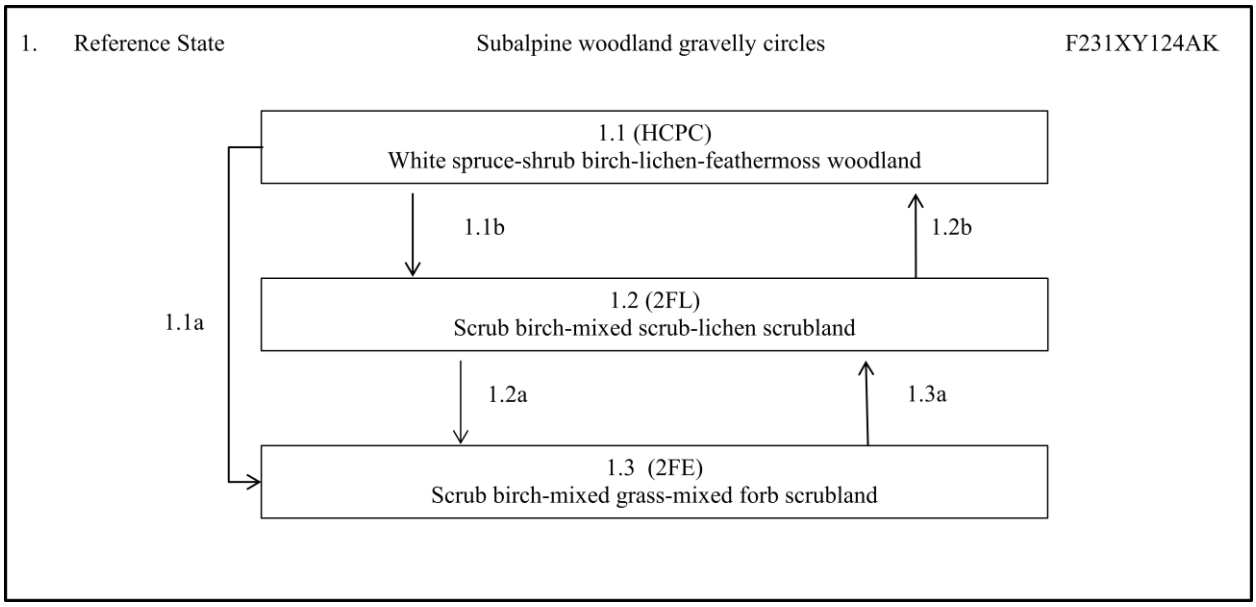
Ecological Site Description ID:	F231XY124AK

Ecological Dynamics of the Site:

This sub-alpine ecological site was observed at high elevation generally on convex backslopes of mountains (i.e. > 5% slopes; between 850-1150 meters). In this ecological site, cryoturbation resulted in patterned ground features known as circles. For community phase 1.1, soils were classified as haplocryepts and were composed of organic matter over gravelly cryoturbate. No obvious rock sorting was observed. Rocks are typically present but not abundant at the soil surface. While white spruce was present, cover in climax phase was generally sparse and deemed limited in large part due to the cold micro-climate. While occurring in similar landscape positions as R231XY129AK, soils associated with the above ecological site have greater rock fragments and lack permafrost.

Fire was a documented disturbance regime resulting in three observed phases. The typical fire return interval for coniferous forests of interior Alaska is approximately 100 years. For this ecological site, high-severity fire events are believed to be more typical then low-severity fire events. Low-severity and high-severity fire events appear to cause differences in the depth of organic material on the soil surface, present vegetation, and potential vegetation

State and Transition Diagram:



State ID Number:	1	State Name:	Reference
State Narrative:	For the climax phase, dominant vegetation was a mixture of shrubs growing at the medium, low, and dwarf stratums. Tree cover was sporadic and occurred evenly across the tall, medium, stunted, and regenerative stratums. Sites were considered woodlands (i.e. 10-25% tree cover). The decision to split the phases was based primarily on the general height/age of the trees present, which we felt		

	indicated time since fire disturbances. From field observations, fire completely removed the tree canopy. As early phase vegetation was a mixture of broadleaf tree regeneration and herbaceous plants, disturbance was likely a high-severity fire event. This high-severity fire likely consumed much of the organic mat exposing mineral soils. While many pre-fire species likely regenerate post-fire, conditions are suitable for the establishment and growth of species with wind-blown seed (e.g. paper birch, fireweed, willow). In interior Alaska, the dominant sub-alpine tree species is *Picea glauca*. As *Picea glauca* establishes after fire from off-site seed sources, fire return intervals likely play a substantial role in controlling the abundance of white spruce cover at any given location. Shorter fire return intervals will likely result in less long-term coniferous tree cover than areas with longer fire return intervals. Medium shrubs are defined to grow 3-10' in height, low shrubs are defined to grow 8" – 3' in height, and dwarf shrubs are defined to grow less than 8" in height. Tall trees are defined as trees growing >40' in height, medium trees are defined as growing 15-40' in height, while stunted and regenerative trees are defined as growing less than 15' in height.
Photo 1.1	

Community Phase Number:	1.1	Community Phase Name:	White spruce-shrub birch-lichen-feathermoss woodland

Community Phase Narrative:
The tree canopy was split fairly uniformly between stunted, regenerative, medium, and tall trees and was considered woodland. While *Picea glauca* was the most common tree species, *Picea mariana* was also

observed. For this phase, *Picea glauca* averaged 70 years (i.e. ranging between 28-123). This phase had abundant shrub cover mostly concentrated in the low and dwarf stratums. The most common medium shrub was *Betula glandulosa*, the most common low shrubs were *Betula glandulosa* and *Vaccinium uliginosum*, and the most common dwarf shrub was *Empetrum nigrum*. Graminoids and forbs were minor vegetative components. Lichen and moss was evenly distributed across the site combining for >50% ground cover. Lichen diversity was high but no individual species dominated. The most common moss were *Hylocomium splendens* and *Pleurozium schreberi*.

Community Pathways	
Pathway Number	Pathway Name & Description
1.1a	High-severity fire.
1.1b	Low-severity or spot fires. Fire removes majority of spruce cover but shrubs quickly regenerate post-fire.

Photo 1.2			
Community Phase Number:	1.2	Community Phase Name:	Scrub birch-mixed scrub-lichen scrubland
Community Phase Narrative:			
As most other vegetative components were similar between the late and climax phases, the tree canopy was the major distinguishing factor. The tree canopy mostly consisted of stunted and regenerative trees			

and typically did not have enough cover to be considered woodland (i.e. < 10% tree cover). While *Picea glauca* was the most common tree species, *Picea mariana* and *Betula neoalaskana* were also observed. For this phase, *Picea glauca* averaged 54 years of age (i.e. ranging from 19-117) and dbh of sampled trees averaged 3.8". The most common medium and low shrub was *Betula glandulosa*, while the most common dwarf shrubs were *Empetrum nigrum*, *Vaccinium vitis-idaea*, and *Ledum palustre*. Graminoids and forbs were minor vegetative components. Lichen cover and diversity was high. Common lichens included various *Cladina sp*. and *Masonhalea richardsonii*.

Community Pathways	
Pathway Number	Pathway Name & Description
1.2a	Fire.
1.2 b	Normal time and growth without fire disturbance. White spruce mature into woodland. The fire return interval was presumed to be shorter then phase 1.1 but longer than phase 1.3.

Photo 1.3			
			
Community Phase Number:	1.3	Community Phase Name:	Scrub birch-mixed grass-mixed forb scrubland
Community Phase Narrative:			
The tree canopy was all in the regenerative stratum and was primarily *Populus tremuloides*. When compared to climax and late phase vegetation, shrub and lichen cover was substantially reduced. The			

most common shrub was *Betula glandulosa*. Unlike the late and climax phase, graminoids and forbs were major vegetative components. While the most common graminoids were *Festuca altaica* and *Calamagrostis canadensis*, the most common forb was *Chamerion angustifolium*. This phase had two observations.

Community Pathways	
Pathway Number	Pathway Name & Description
1.3a	Normal time and growth without disturbance.